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Paul L. Connolly

Ciaran J. Kelly

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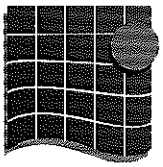

Marine Institute
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Fisheries Leaflet No. 185 (1999)

Results of 1997 Longline Survey of The Rockall Trough

by

Paul L. Connolly, Ciaran J. Kelly, Maurice Clarke
and Nils-Roar Hareide*

Marine Institute, Rinville, Oranmore, Co. Galway, Ireland
*More Research, Alesund, Norway

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Summary

The present survey took place over a period of 12 days in August 1997 along the eastern slope of Rockall Trough between 53 and 58 ° N including the Northern slope of the Porcupine Bank. Fishing was carried out in six separate areas, in depths between 300 and 2,925 meters. The primary objective of the survey was to obtain samples of chondricthyan and teleost fish for the Marine Institute (MI) deepwater research programme, for contaminant analysis of fish by the MI chemistry section and for food technology analysis at the Teagasc National Food Centre. The survey was carried out on the Norwegian commercial long-liner "*Skarheim*," using commercial deep-water autoline gear. In total over 70,000 hooks were set during the trip and on average 80% of these were baited. In total 20 species of chondricthyan and 18 species of teleost fish were taken. Among the most abundant species in the catch were leafscale gulper shark *Centrophorus squamosus* (36%), birdbeak dogfish *Deania calcea* (21%), Portuguese dogfish *Centroscyllium coelolepis* (13%), tusk *Brosme brosme* (11%) and mora *Mora moro* (6%). Over the entire survey, discarding was estimated as 30% of the total catch. The main species discarded were birdbeak dogfish and greater lantern shark *Etmopterus princeps*. Catch per 1,000 hooks showed that highest abundances were found at 600 – 1,100 metres throughout the whole fishing area. Three settings were made at depths between 2,000 and 3,000 meters. These shots gave valuable information about depth distribution of different species and also brought up species that have never been recorded in the Rockall Trough before.

Introduction

The Marine Institute (MI) commenced a deep-water survey programme in 1993 and to date 4 trawl and 1 longline surveys have been conducted in the deep waters off the west coast of Ireland and Scotland. The purposes of these surveys have been to secure samples of deep-water fish. Deep-water fish stocks are currently being heavily exploited in these areas, with little known about the stocks and there are no effective management measures in place. The MI programme has focused on providing the basic biological information necessary for future assessment and management of the fishery. The survey programme has also secured samples for contaminant analyses by the MI (chemistry section) and for food analysis by the National Food Centre.

The MFV *Skarheim*, a 50 m longliner based in Ålesund, Norway was charted from the Møreforsking, Ålesund Norway, to undertake a 10-day longline survey in the deep water of the Rockall Trough. The vessel berthed in Killybegs on 31st July following a survey in the mid-Atlantic ridge area during July.

Personnel

Paul L. Connolly (Chief Scientist)	Marine Institute
Maurice Clarke	Marine Institute
Ciaran J. Kelly	Marine Institute
Mike Fitzpatrick	Marine Institute
Greta Garnes	Møre Research
Nils R. Hareide	Møre Research

Materials and Methods

The sample design involved setting lines in each of 5 areas (Figure 1) in the depth strata 500 – 700 m, 700 – 900 m, 900 – 1,100 m, 1,100 m – 1,300 m and 1,300 m – 1,500. In addition, in area 5 (2) there were shot lines in the depth strata 1,500 – 2,000 m, 2,000 m – 2,500 m and 2,500 m – 3,000 m. The vessel used for this survey was the Norwegian commercial longliner *Skarheim.* The vessels details are as follows: built, 1966; length, 49.6 m beam, 8.86 m; draught, 4.53 m; main engine: Deutz developing 1000 b.h.p. ; gear capacity 35,000 hooks. Volume of frozen hold, 500 m3 and bait hold, 40 m^3.

Lines of 9 mm were used. They were shot in magazines (1,470 hooks). The hook size used was Mustad 12/0 EZ. Snoods were of 40 – 70 cm in length attached

to the main line by swivels at intervals of 1.4 m. Bait used was squid and mackerel. In total 70,826 hooks were set during the trip and on average 80% of these were baited.

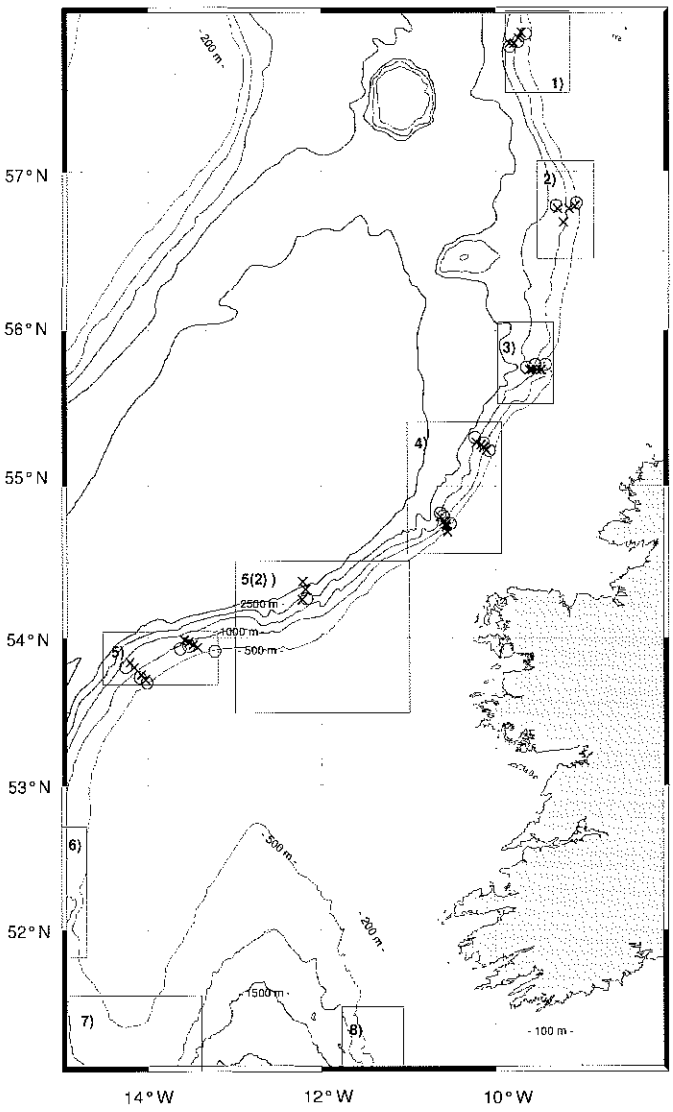

Figure 1. Shoot positions (x) and positions for CTD and Plankton hauls (o) for deepwater long-line survey 2nd August to 14th August 1997.

Species were identified according to Stehmann (1998), Whitehead (1984), and Compagno (1984). Length measurements of total catch were taken as the lines were hauled. Weight information was also taken for every species. This was used to develop length-weight regressions that were used to obtain estimates of total weight. Age structures of *C. squamosus*, *C. coelolepis* and *D. calceus* were collected. Specimens of unidentified fish were frozen for analysis at the laboratory. Samples of many of the species were frozen for food technology and product development work.

Results and Discussion

Survey Narrative

Day 1

Scientific personnel from the MI arrived at the vessel on 2/8/97 and gear was loaded on board. A meeting was held with the skipper to discuss the survey plan. The vessel departed Killybegs at 17.00hrs and steamed for Area 2.

Day 2

Fishing commenced at 07.00 hrs on 3/8/97 and lines were set in 4 depth strata (1,400-1,200; 1,200-1,000; 1,000-800; 8,000-600 m). Weather conditions were calm (force 1-2). Catches were mainly *Centroscymnus coelolepis* (Portuguese dogfish) and *Centrophorus squamosus* (leafscale gulper shark) in the deeper shots and *Brosme brosme* (tusk), *Phycis blennoides* (forkbeard) on the shallower lines. Three plankton samples and CTD information were taken at 1,200, 800 and 600 m in Area 2.

Day 3

Skarheim steamed for Area 1 on 4/8/97 and commenced fishing at 600hrs. Lines were set in the 4 depth ranges. There were French vessels fishing in the area. Catches in this area were poor with *Etmopterus princeps* (greater lantern shark), and *C. squamosus* in the deeper lines and poor catches of tusk and forkbeard on the shallower lines. Weather conditions remained very good. Three plankton samples with CTD information were taken at 600, 800 and 1,200 m in Area 1.

Day 4

During 5/8/97, the vessel steamed south to Area 3 and commenced fishing at 17.00 hrs. Four lines were set in the usual depth ranges. Catches were very good with *C. squamosus, E. princeps* and *C. coelolepis* dominating the deeper lines and tusk, *Molva dypterygia* (blue ling), *Mora moro* (mora) and *C. squamosus* dominating the shallower catches. Three plankton samples with CTD information were taken at 1,200, 800 and 600 m in Area 3. Weather conditions were excellent (force 2-3). *Skarheim* steamed for the north of Area 4.

Day 5

Fishing was carried out during 6/8/97 in the north of Area 4. Catches were very good with *C. coelolepis, E. princeps* and *C. squamosus* dominating the deeper lines and

forkbeard, tusk, and *Galeus melastomus* (blackmouth cat shark) dominant in the shallower lines. The catches were regarded as good commercial catches by the skipper. Three plankton samples with CTD information were taken at 600, 800 and 1,200 m in Area 3. Weather conditions were perfect (force 2-3).

Day 6

During 7/8/97, *Skarheim* fished in the south of Area 4. Four lines were shot in the normal depth strata. An additional haul was made in "shallow" water (300-430 m). *C. coeolepis* and *Deania calceus* (birdbeak shark) dominated the deeper lines while *G. melastomus, Chimaera monstrosa* (rabbitfish), tusk, mora dominated the shallower lines. *G. melastomus* dominated the 300-400 m shot. Weather remained good. French trawlers were fishing in the area.

Day 7

During 8/8/97, *Skarheim* steamed to a deep-water site (Area 5 (2)) and three lines were set at 3,000, 2,500 and 2,000 m to investigate the species composition at this depth. *Antimora rostrata, Nematonurus armatus, Spectrunculus grandis* and *Coryphaenoides guntheri* dominated the catches. Ray species were frozen for later identification (see comments). One plankton haul and CTD information was taken at 2,500 m. Weather was good (force 2-3). A Spanish longliner was observed fishing in the area.

Day 8

Skarheim steamed to Area 5 and in the eastern sector, 4 lines and 3 plankton hauls were completed during 9/9/97. Weather conditions were moderate (force 4-5) with mist and rain.

Day 9

Hauling commenced in the early hours of 10/9/97 with *C. coelolepis* and *E. princeps* dominating the deeper lines and *D. calceus*, morid cod and forkbeard dominating the shallower lines. Weather conditions were moderate (force 4-5) with mist and rain.

Day 10

Steamed west to Area 5 and shot four lines at the usual depth strata. Three plankton tows were taken at 600, 800 and 1,200 m. Weather conditions were good (force 2-3). The catch from these lines was dominated by *C. coelolepis* in the deeper lines

and by *D. calceus* and mora on the shallower lines. Weather conditions were good (force 3-4). The survey was completed at 19.00 hrs.

Day 11 & 12

It was agreed with the skipper, that *Skarheim* would undertake two days commercial fishing in Area 5 and Area 4 over the two day period 12/8/97 and 13/8/97. *Skarheim* returned to Killybegs on 14th August 1997. MI scientific staff unloaded gear and samples from the vessel and returned to MI.

Oceanographic Data

The temperature in the depths between 200 and 2,000 m varied between 10.5° and 3.4° C (Figure 2). Waters deeper than 2,000 meters were not sampled. The temperature decreased gradually with depth and the lowest temperature was found at 2,000 m. The salinity was between 35.6 and 35.4 ‰. This salinity indicates that the water masses origins from the North Atlantic Drift (Gulf Current). Temperature and salinity profiles for the individual areas surveyed are presented in Figures 3 and 4.

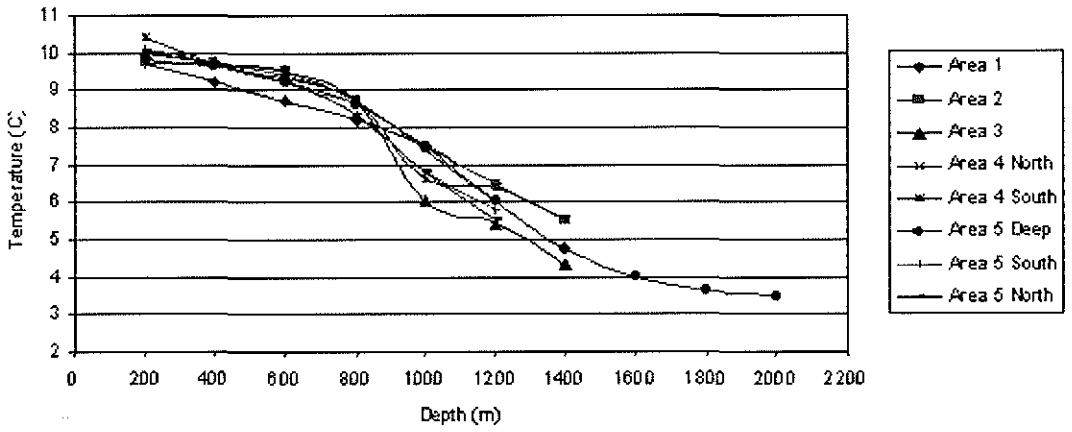

Figure 2. Temperature by depth in the different fishing areas.

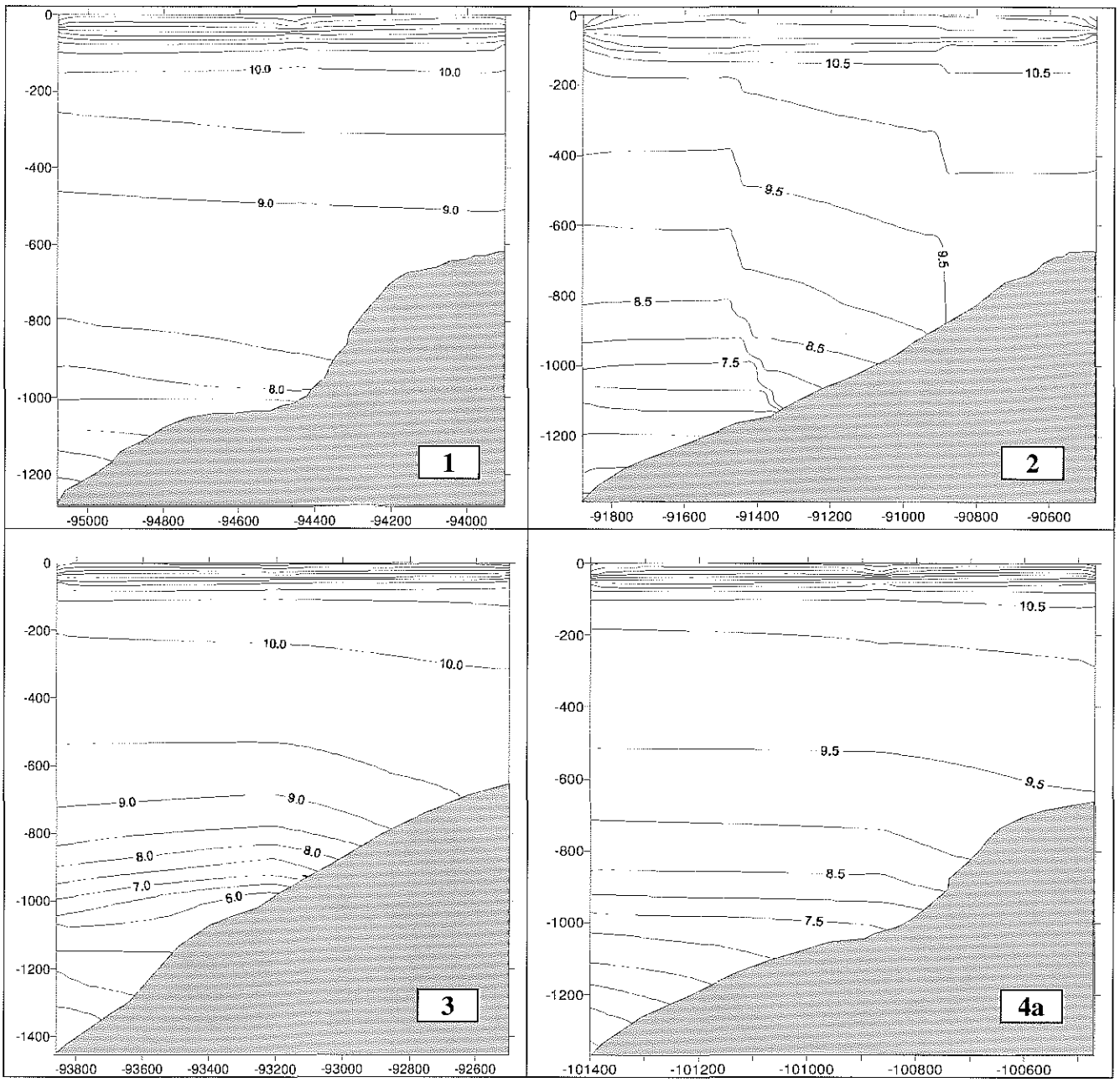

Figure 3. Temperature profile for areas 1, 2, 3 and 4a.

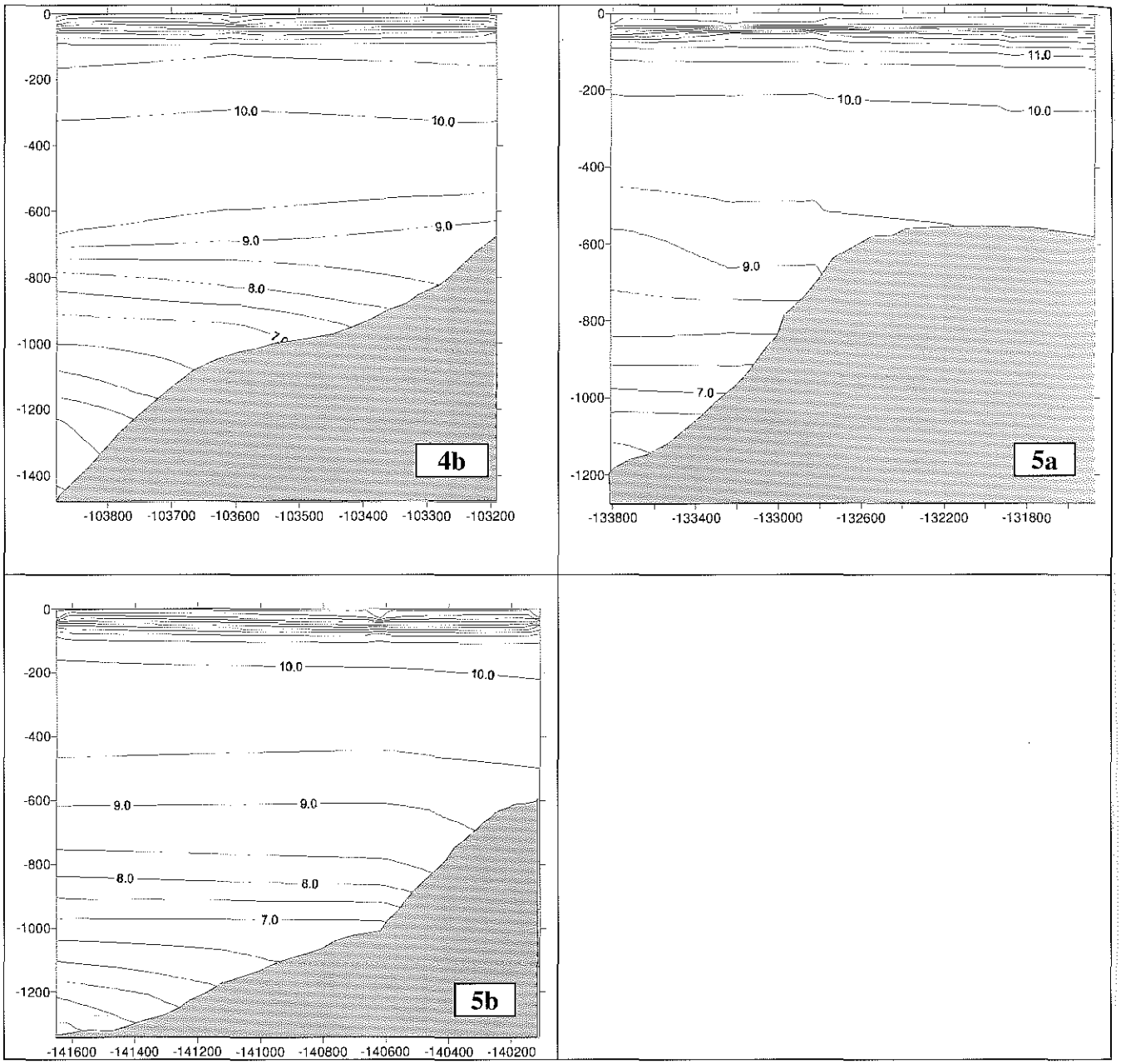

Figure 4. Temperature profile for areas 4b, 5a and 5b.

Catch Data

The total catch during the survey was 21,471 kg (Table 1). The three most important species were the squalid sharks; leafscale gulper shark (*Centrophorus squamosus*) (36%), birdbeak dogfish (*Deania calcea)* (21%) and Portuguese dogfish, (*Centroscymnus coelolepis*) (13%). The birdbeak dogfish has no commercial value and was discarded. The two commercial squalid shark species leafscale gulper shark and Portuguese dogfish combined contributed to 49% of the catches. The commercial teleost fishes, tusk (*Brosme brosme*), mora (*Mora moro)*, forkbeard (*Phycis blennoides)*, ling (*Molva molva)* and blue ling (*Molva dypterigia)* comprised 21% of the total catch. Discard species amounted to 30% of the total catch. The distribution by depth and temperature for the main species is shown in Figure 5. The catch for each longline setting is shown in Table 2. The distribution of catches by depth and temperature is shown in Figure 5. See Appendix I for list of species.

Table 1. Species caught during the survey.

Species	Common name	KG	%
Centrophorus squamosus	leafscale gulper shark	7812	36.38
Deania calceus	birdbeak dogfish	4401	20.50
Centroscymnus coelolepis	Portuguese dogfish	2739	12.75
Brosme brosme	tusk	2298	10.70
Mora moro	mora	1261	5.87
Etmopterus princeps	lantern shark	619	2.88
Phycis blennoides	forkbeard	457	2.13
Chimaera monstrosa	rabbitfish	306	1.42
Molva molva	ling	291	1.35
Antimora rostrata	antimora	270	1.26
Centroscymnus crepidater		265	1.23
Molva dypterygia	blue ling	261	1.22
Coryphaenoides guntheri		134	0.63
Bathyraja richardsoni		88	0.41
Nematonurus armatus	armed grenadier	67	0.31
Helicolenus dactylopterus	bluemouth	62	0.29
Bathyraja pallida		41	0.19
Pseudotriakis microdon	false catshark	35	0.16
Synaphobranchus kaupi	cut-throat eel	32	0.15
Lepidion eques		19	0.09
Etmopterus spinax	velvet belly	13	0.06
Cottunculus thompsoni	pallid sculpin	1.2	0.01
Trachyrhyncus murrayi	Murray´s longsnout grenadier	0.98	0.005
Total		21.471	100.00

Table 2. Station positions, number of hooks and catch (kg round weight) of the most important species for each longline setting.

Haul	Area	Depth(m)			Position Shot						Position Hauled						Hooks	Catch (kg round weigth)								
		Min	Max	Mean	Lat	Lat	Lat	Long	Long	Long	Lat	Lat	Lat	Long	Long	Long		B. brosme	C. squamosus	C. coelolepis	C. crepidater	D. calceus	M. dypterygia	M. Molva	M. moro	P. blennoides
1	2	1236	1341	1289	56	46	2	9	17	6	56	46	1	9	14	5	2226		106	141	15	5	3			
2	2	1120	1166	1143	56	41	1	9	13	4	56	41	1	9	10	5	1120		489	28	12	17	0			
3	2	870	941	906	56	46	1	9	9	3	56	46	4	9	6	4	1120	196	811	0	2	8	2			3
4	2	604	764	684	56	47	0	9	5	9	56	47	1	9	3	5	1800	220	0			.	15			37
5	1	1350	1224	1287	57	47	5	9	50	9	57	47	6	9	47	9	2320		46	166			0			
6	1	920	1168	1044	57	47	9	9	47	4	57	48	4	9	44	8	2320	0	1274		13	25	0			
7	1	749	776	763	57	49	1	9	44	7	57	50	1	9	42	1	2340	44	45			2				
8	1	620	763	692	57	51	1	9	42	1	57	52	3	9	40	0	2340	87	37		0					8
9	3	1200	1401	1301	55	45	2	9	36	5	55	45	3	9	34	1	2320		305	212	9	4	5			
10	3	1040	1159	1100	55	45	8	9	34	4	55	46	6	9	31	8	1900	10	162	235	0	7	42			
11	3	900	1009	955	55	45	9	9	31	5	55	45	9	9	28	4	2320	195	557	52	9	9	62		161	
12	3	730	820	775	55	45	2	9	28	2	55	45	6	9	25	5	2320	447	564		0	47	16			49
13	4a	1230	1315	1273	55	17	7	10	13	1	55	17	0	10	10	4	2320		18	149	26	7				
14	4a	1011	1143	1077	55	16	5	10	10	3	55	15	8	10	8	1	2320		240	171	71		4		6	
15	4a	935	1004	970	55	15	5	10	8	8	55	14	7	10	6	4	2320	27	807	48	31	55	12		1	
16	4a	608	828	718	55	14	2	10	6	2	55	13	4	10	3	9	2320	30	326		8	18	3			37
17	4b	1120	1317	1219	54	48	5	10	38	4	54	47	0	10	37	1	2320		74	246	14	21				
18	4b	805	1000	903	54	46	6	10	36	5	54	45	5	10	34	3	2320	0	472	76	15	125	0		0	
19	4b	576	904	740	54	45	0	10	34	8	54	44	2	10	32	5	2320	492	293	14	2	845			151	78
20	4b	387	704	546	54	44	1	10	34	1	54	43	0	10	32	1	2320	479	76			136	30	66	107	133
21	4b	292	428	360	54	42	7	10	33	2	54	41	7	10	31	2	2300	12						224		8
22	Deep	1869	1924	1897	54	15	1	12	13	6	54	15	8	12	11	4	2320									
23	Deep	2419	2520	2470	54	19	6	12	11	1	54	19	3	12	11	5	2320									
24	Deep	2920	2925	2923	54	22	8	12	13	2	54	22	9	12	15	8	2320									
25	5a	1291	1418	1355	53	59	7	13	35	6	53	58	7	13	33	6	2320		40	254		4				
26	5a	1157	1191	1174	53	58	4	13	32	7	53	57	3	13	30	6	2320	5	324	93	12	109	17		80	
27	5a	650	962	806	53	57	3	13	29	4	53	56	3	13	27	5	2320		180		0	307	15		75	4
28	5a	571	704	638	53	56	0	13	26	1	53	55	1	13	23	8	2320	21	33			777	2		59	51
29	5b	1321	1380	1351	53	50	4	14	13	4	53	49	2	14	11	7	2320		37	549	2					
30	5b	1143	1214	1179	53	48	4	14	10	3	53	47	3	14	8	4	2320		28	298	15	33	4			3
31	5b	906	1030	968	53	45	5	14	5	4	53	44	6	14	3	7	2320	12	99		7	400	29		546	
32	5b	639	738	689	53	43	8	14	2	4	53	42	8	14	0	5	2320	21	25	7		566			75	46
Total																		2298	7469	2739	265	3527	261	291	1261	457

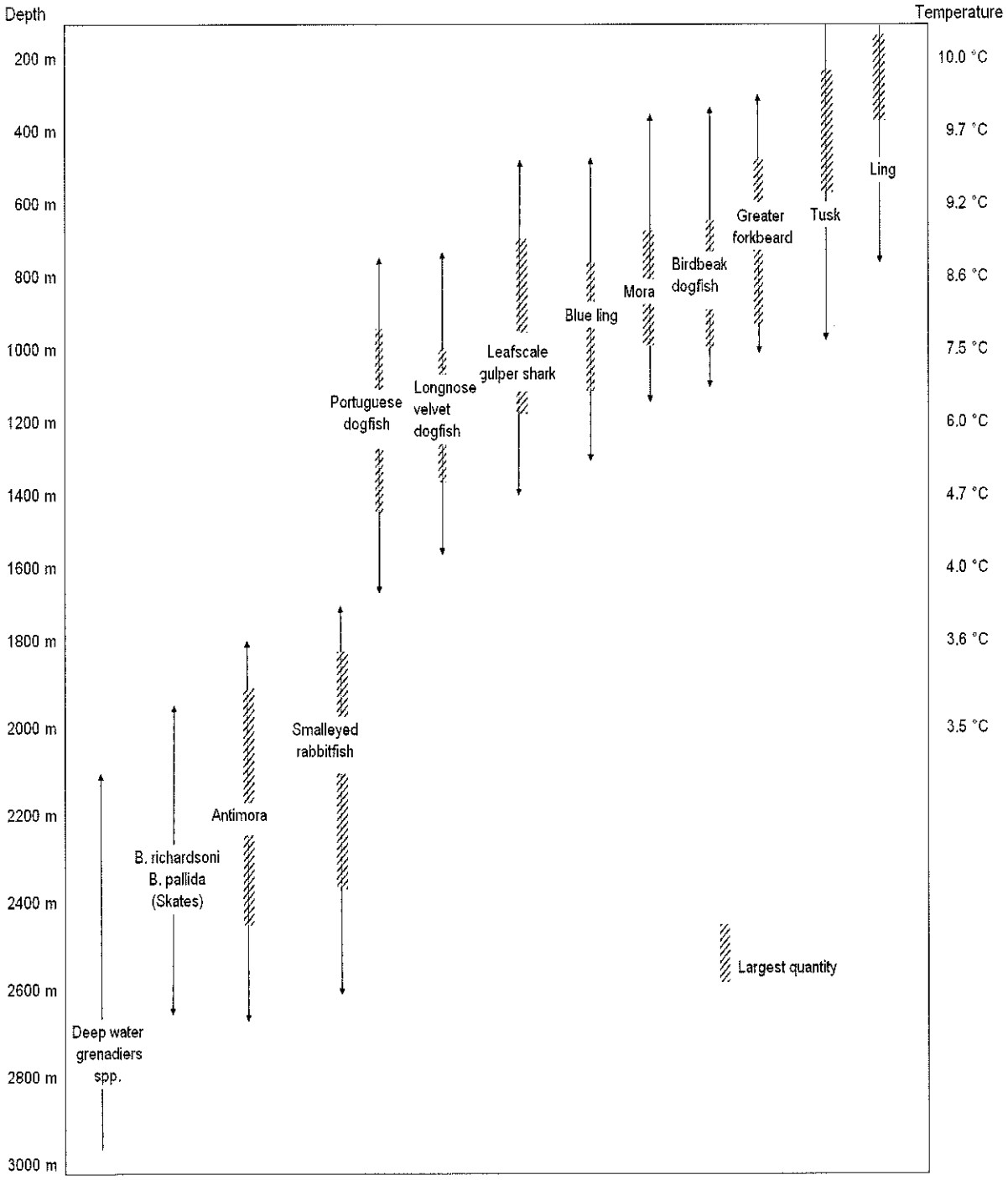

Figure 5. Distribution of fish species by depth and temperature.

Blue ling (*Molva dypterygia*)

Total catch of this species was 261 kg (round weight) (Table 1). It was caught in all fishing areas in depths between 500 and 1400 m in temperatures between 5.5°

C and 9.5° C. (Figures 5 and 6) Highest catches were recorded in Area 3. Peak catch rates came from 1,000 m to 1,100 m. Highest catch rate recorded was 27 kg per 1,000 hooks. The total lengths of this species varied between 57 and 134 cm. The length distribution is shown in Figure 7.

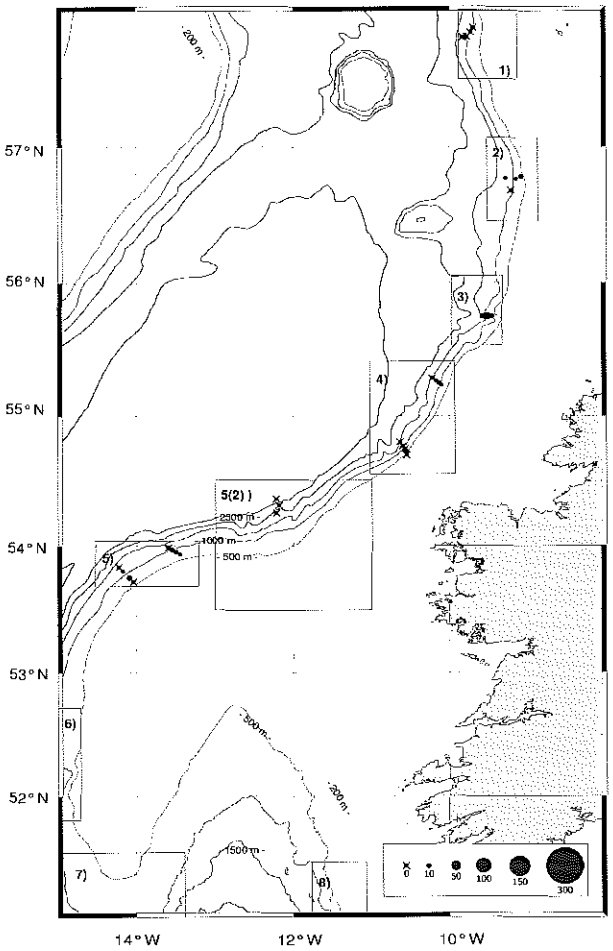

Figure 6. Catch per unit of effort for blue ling (*Molva dypterygia)* in kg per 1,000 hooks during the survey.

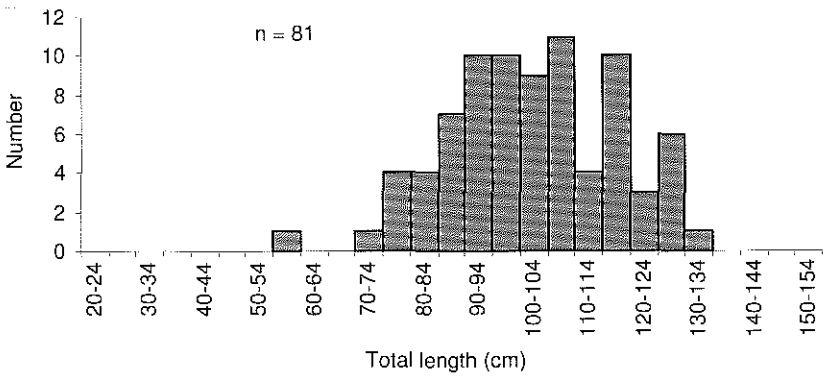

Figure 7. Length frequency distribution for blue ling (*Molva dypterygia*).

Tusk (*Brosme brosme)*

Total catch of this species was 2,298 kg (round weight) (Table 1). It was caught in all fishing areas in depths between 300 and 1,150 m in temperatures between 7.5° C and 10.0° C. (Figures 5 and 8) Highest catches were recorded in areas 2, 3 and 4. Peak catch rates of *Brosme brosme* came from 500 to 900 m. Highest catch rate recorded was 212 kg per 1,000 hooks. The smallest length recorded was 38 cm and the greatest was 97 cm. (Figure 9.)

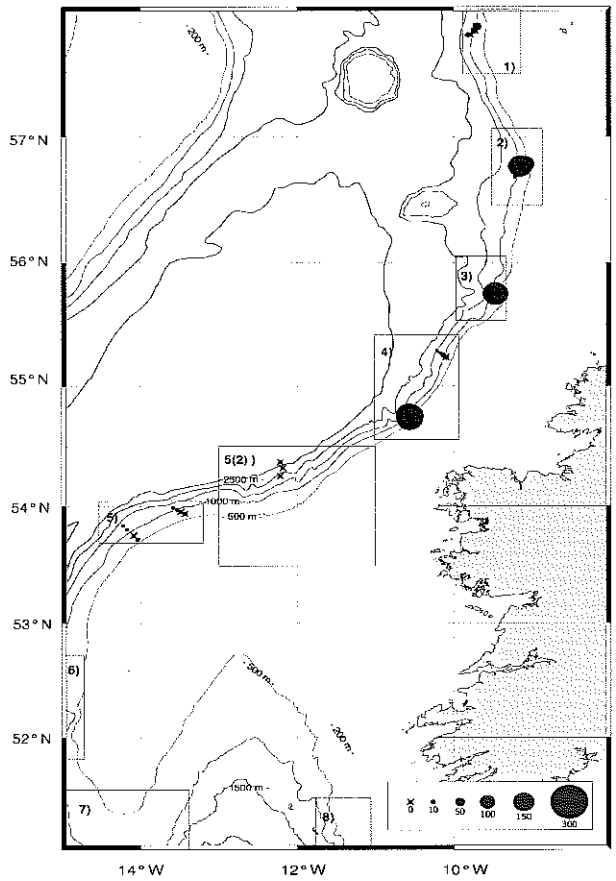

Figure 8. Catch per unit of effort for tusk (*Brosme brosme*) in kg per 1,000 hooks during the survey.

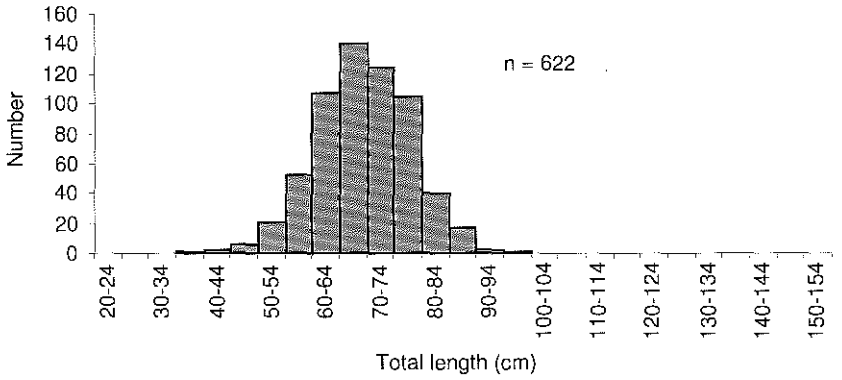

Figure 9. Length frequency distribution for tusk (*Brosme brosme*).

Leafscale gulpershark (*Centrophorus squamosus*)

Total catch of this species was 7812 kg (Table 1). The absolute depth range for this species was 500 m – 1,400 m in temperature between 4.7 and 9.5° C (Figures 5 and 10). Highest catches were recorded in Area 2. Peak catch rates of *Centrophorus squamosus* came from 800 m to 1,100 m. Highest catch rate recorded was 724 kg per 1,000 hooks. The smallest length recorded was 83 cm for females and 84 cm for males. The greatest lengths were 133 cm for males and 140 cm for females (Figure 11).

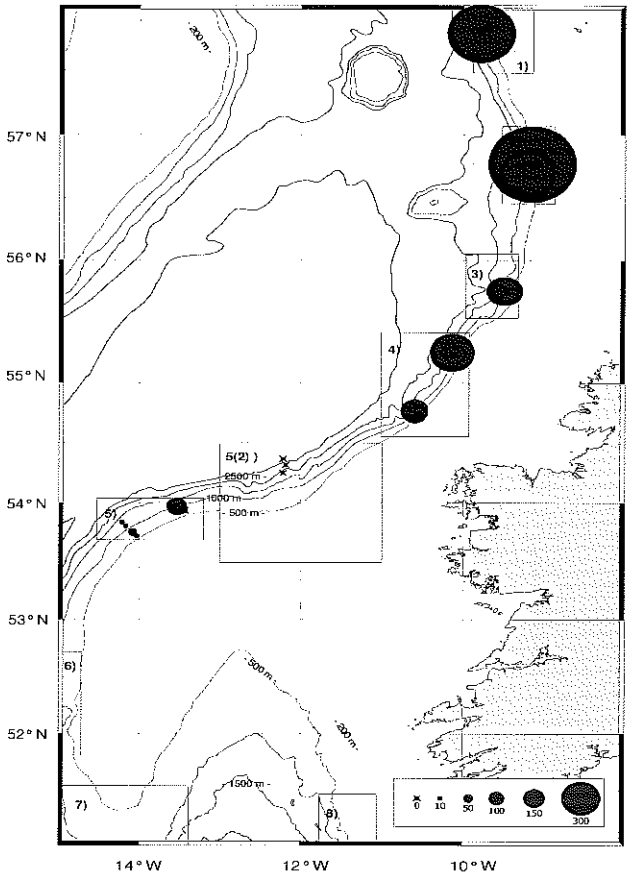

Figure 10. Catch per unit of effort for leafscale gulper shark (*Centrophorus squamosus*) in kg per 1,000 hooks during the survey.

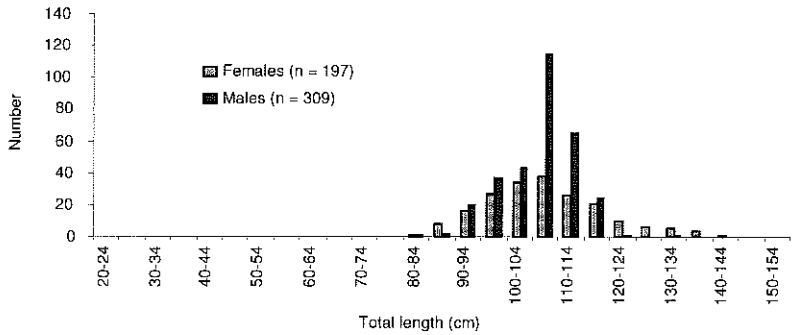

Figure 11. Length frequency distribution for leafscale gulper shark (*Centrophorus squamosus*).

Longnose velvet dogfish (*Centroscymnus crepidater*)

Total catch of this species was 265 kg (round weight) (Table 1). It was caught in all fishing areas in depths between 600 and 1,350 meters in temperatures between 8.7 and 4.2° C. (Figures 5 and 12) Highest catches were recorded in Area 4a. Peak catch rates of *Centroscyllium crepidater* came from 1,000 m to 1,100 m. Highest catch rate recorded was 31 kg per 1,000 hooks. The smallest length recorded was 56 cm for females and 37 cm for males. The greatest lengths were 79 cm for males and 85 cm for females (Figure 13).

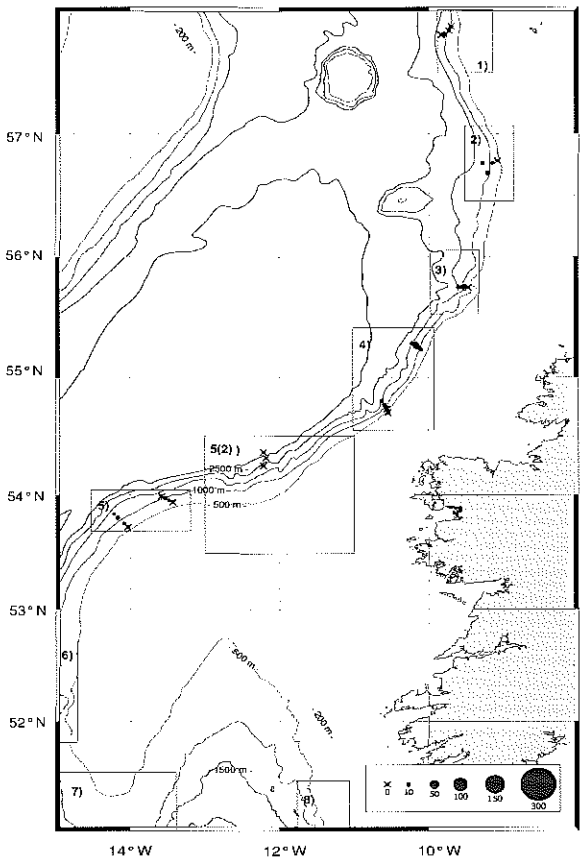

Figure 12. Catch per unit of effort for longnose velvet dogfish (*Centroscymnus crepidater*) in kg per 1,000 hooks during the survey.

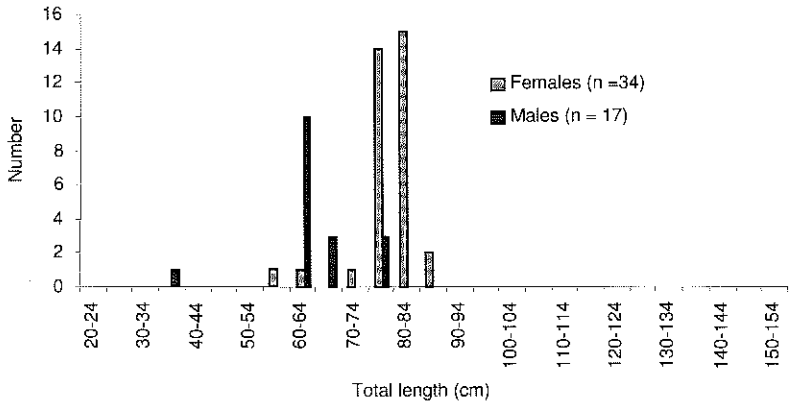

Figure 13. Length frequency distribution for longnose velvet dogfish (*Centroscyllium crepidater*).

Portuguese Dogfish (*Centroscymnus coelolepis*)

Total catch of this species was 2,739 kg (round weight) (Table 1). It was caught in all fishing areas in depths between 650 and 1,450 meters in temperatures between 3.8° C and 8.7° C (Figures 5 and 14). Highest catches were recorded in Area 5. Peak catch rates of *Centroscymnus coelolepis* came from 1,000 m to 1,350 m. Highest catch rate recorded was 236 kg per 1,000 hooks. The smallest length

recorded was 75 cm for females and 68 cm for males. The greatest lengths were 109 cm for males and 118 cm for females (Figure 15).

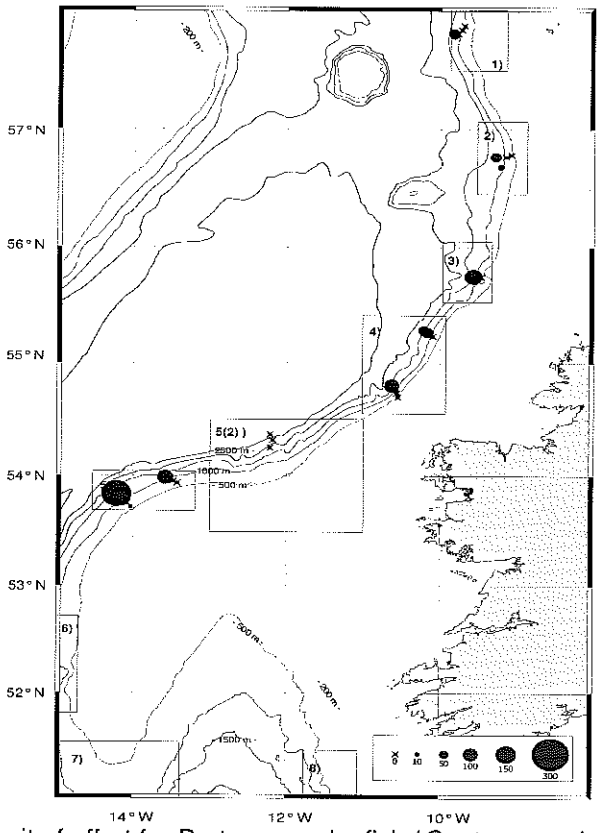

Figure 14. Catch per unit of effort for Portuguese dogfish (*Centrosccymhus coelolepis*) in kg per 1,000 hooks during the survey.

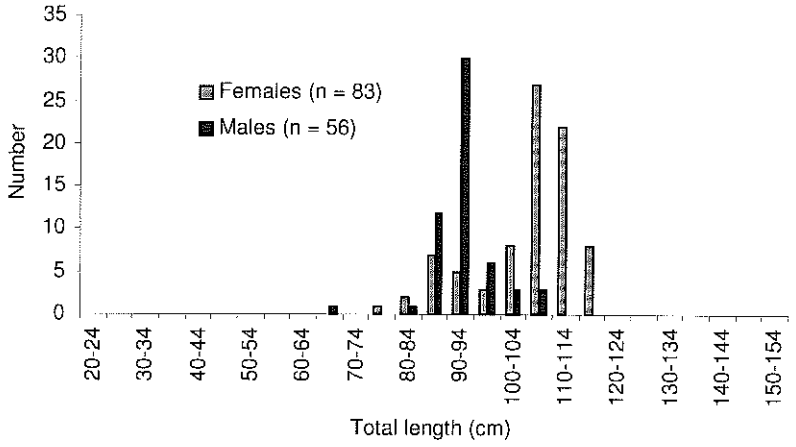

Figure 15. Length frequency distribution for Portuguese dogfish (*Centroscyllium coelolepis*).

Ling (*Molva molva*)

Total catch of this species was 291 kg (round weight) (Table 1). It was caught in area 4 in depths between 290 and 500 m in temperatures between 8.5° C and 10.5° C on the two shallowest hauls during the whole trip. (Figures 5 & 18) Highest catch rate recorded was 98 kg per 1,000 hooks. The smallest length recorded was 63 cm and the greatest was 120 cm. (Figure 19)

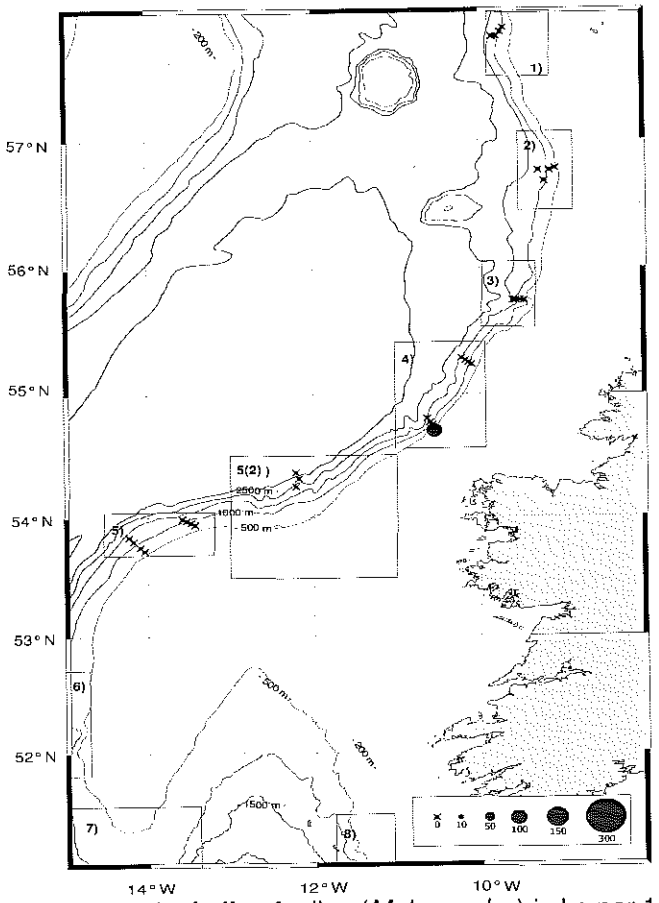

Figure 18. Catch per unit of effort for ling (*Molva molva*) in kg per 1,000 hooks.

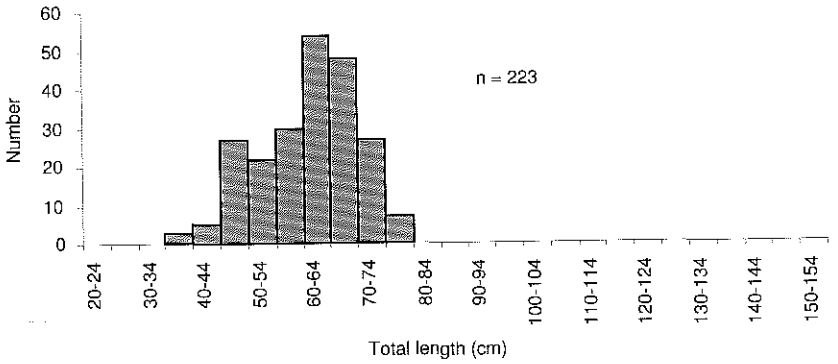

Figure 19. Length frequency distribution for ling (*Molva molva*).

Mora (*Mora moro*)

Total catch of this species was 1,261 kg (round weight) (Table 1). It was caught in all fishing areas 3, 4 and 5 in depths between 500 and 1,150 meters in temperatures between 9.7° C and 6.2° C (Figures 5 and 20). The highest catch rates were recorded in Area 5, where a haul at 900-1,000 metres gave 235 kg per 1,000 hooks. The smallest length recorded was 30 cm and the greatest lengths were 78 cm (Figure 21).

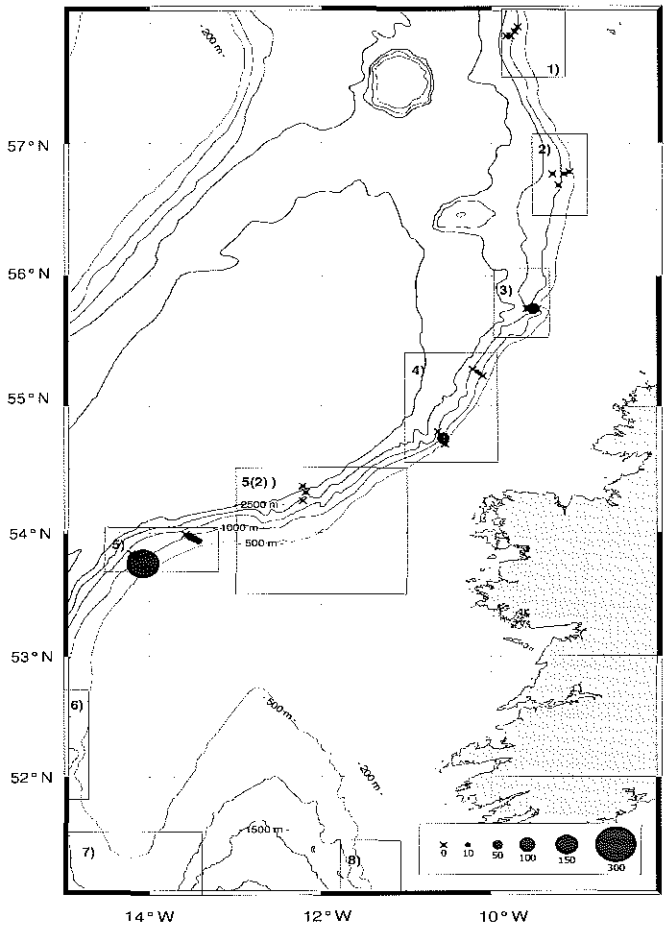

Figure 20. Catch per unit of effort for mora (*Mora mora*) in kg/1,000 hooks during the survey.

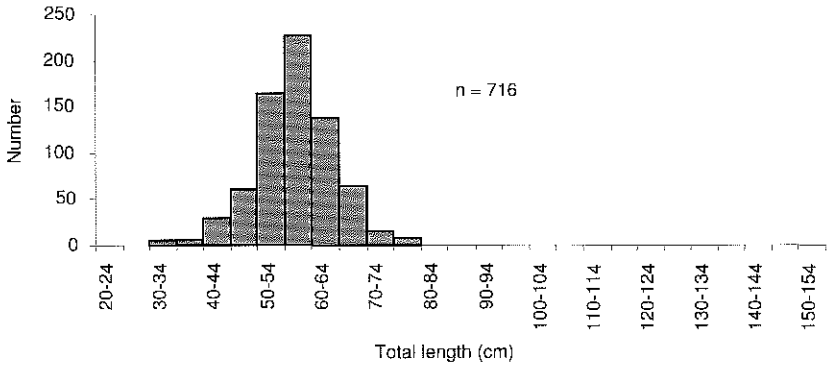

Figure 21. Length frequency distribution for mora (*Mora mora).*

Greater forkbeard (*Phycis blennoides*)

Total catch of this species was 457 kg (round weight) (Table 1). It was caught in all fishing areas in depths between 350 and 900 meters in temperatures between 7.5° C and 9.8° C (Figures 5 and 22). Highest catches were recorded in Area 4 and 5. Peak catch rates of *Phycis blennoides* came from 600 m to 800 m. The lengths varied between 36 and 78 cm (Figure 23).

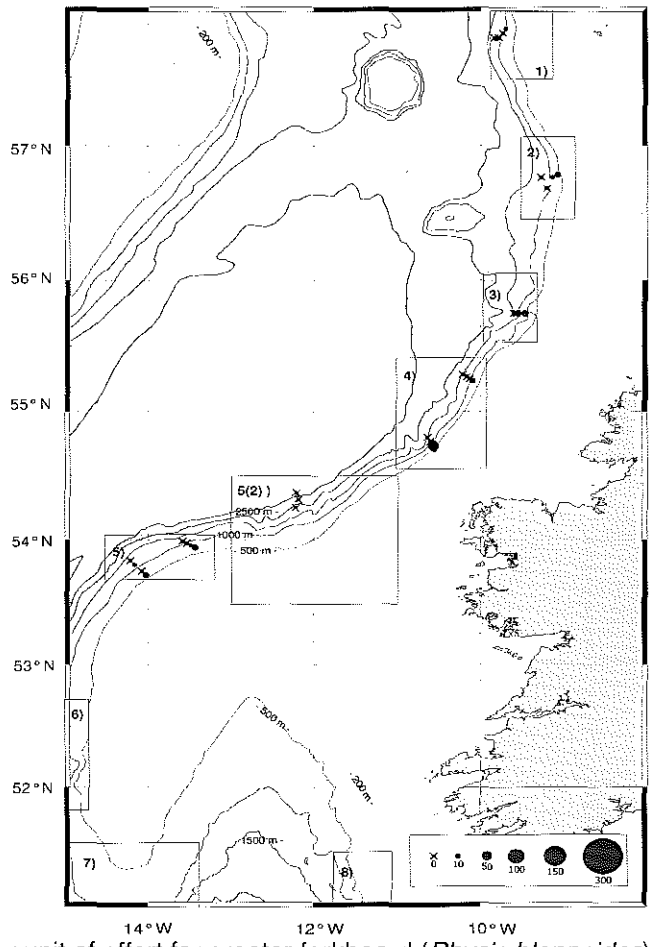

Figure 22. Catch per unit of effort for greater forkbeard (*Phycis blennoides*) in kg per 1,000 hooks.

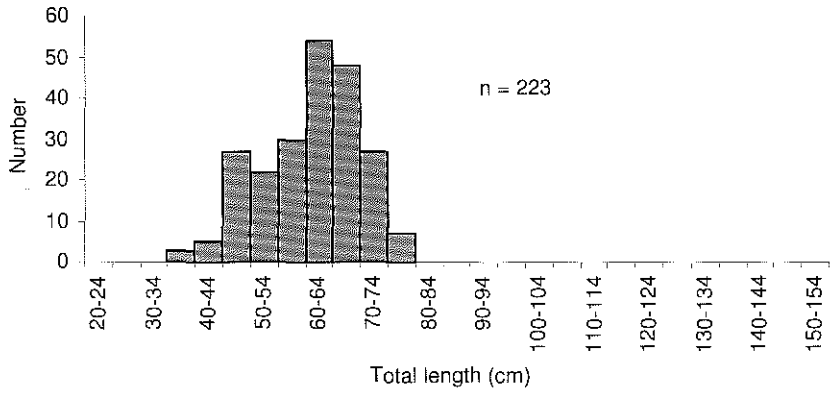

Figure 23. Length frequency distribution for greater forkbeard (*Phycis blennoides*).

Conclusions

Overall, the survey was a great success. Weather conditions were ideal for fishing and for working up the catch on board. A large amount of deep-water shark data (length, weight, maturity, spines, centra, gonads), were secured for the Ph.D. studentship being conducted at MI. Plankton hauls were carried out at 21 stations and associated CTD information was taken at each haul. The plankton samples will be processed as part of a separate study. A selection of deep-water fish was frozen as material for student projects to be undertaken at the MI during 1997. Samples of unidentified deep-water Chimaeras, rays and sharks were frozen for later identification (Clarke, in press).

Elasmobranch species such as squalid sharks and ray species were the most abundant fish taken by the longlines in all areas and especially below 800 m. The catches from shallower settings were dominated by teleost fish such as tusk (*Brosme brosme*), blue ling (*Molva dypterygia*), forkbeard (*Phycis blennoides*) and mora (*Mora moro*). There were very few sharks taken below 2,000 m and catches at these depths and greater were characterised by a lower biomass and the dominance of a few teleost species such as *Nematonurus armatus*, *Antimora rostrata*, *Spectrunculus grandis*, and *Coryphaenoides guntheri*.

In total over 70,000 hooks were set during the trip and on average 80% of these were baited. This gave a catch rate of roughly 10% from baited hooks.

Over 70 kg of fish fillets were taken for the National Food Centre (Teagasc) that will be used in their ongoing analyses of the food value of deep-water fish species. Samples of species of which very little is known (*Galeus melastomus*, *Spectrunculus*, *Coryphaenoides guntheri, Nematonurus armatus*) were frozen and will provide important material for preliminary biological studies of these fish.

Concern has been expressed over the levels of contaminants present in the body tissues of long-lived deep-water fish. It is very important therefore that any species being considered for commercial exploitation be examined for the presence of toxic substances, for which the deep sea acts as a sink. The MI chemistry section will examine round specimens of 6 species for organic and heavy metal contamination.

Acknowledgements

The professionalism, help and courtesy the scientific staff received from the skipper (Mr Kjell Lorgen) and crew of the *MFV Skarheim* contributed to the success of the survey and is gratefully acknowledged. Special thanks are due to Naomi Soffer for organising the final publication of this report.

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Appendix I

List of species identified during the survey.

CHONDRICHTHYES	CHONDRICHTHYANS
Squalidae	**Squalid sharks**
Centroscymnus coelolepis	Portuguese dogfish
Centroscyllium fabricii	black dogfish
Centrophorus squamosus	leafscale gulper shark
Dalatias licha	kitefin shark
Deania calcea	birdbeak dogfish
Etmopetrus princeps	lantern shark
Etmopterus spinax	velvet belly
Somniosus spp.	
Centroscymnus crepidater	long nosed velvet dogfish
Centrophorus uyato	little gulper shark
Charcharhinidae	**Requiem sharks**
Prionace glauca	blue shark
Scyliorhinidae	**Cat sharks**
Apristurus spp.	
Galeus melastomus	blackmouth dogfish
Galeus murinus	mouse catshark
Scyliorhinus canicula	smallspotted catshark
Rajidae	**Skates**
Bathyraja pallida	pale ray
Bathyraja richardsoni	Richardson´s ray
Raja circularis	sandy ray
Raja nidarosiensis	Norwegian skate
Raja oxyrinchus	longnosed skate
Raja kukujevi	Kukujev's ray
Raja fullonica	shagreen ray
Raja hyperborea	Arctic skate
Pseudotriakidae	**False catsharks**
Pseudotriakis mikrodon	false catshark
Chimaeridae	**Chimaeras**
Chimaera monstrosa	rabbitfish
Hydrolagus pallidus	pale ghostshark
Hydrolagus affinis	smalleyed rabbitfish

TELEOSTOMI	TELEOSTS
Congridae	**Conger eels**
Conger conger	conger eel
Synaphobranchidae	**Arrowtooth eels**
Synaphobranchus kaupi	Kaup's eel
Scorpanidae	**Redfish**
Helicolenus dactylopterus	bluemouth
Moridae	**Moras**
Antimora rostrata	
Lepidion eques	
Mora moro	mora
Gadidae	**Gadoids**
Molva dypterigia	blue ling
Molva molva	ling
Phycis blennoides	fork beard
Brosme brosme	tusk
Psychrolutidae	**Fatheads**
Cottunculus thompsoni	pallid sculpin
Macrouridae	**Grenadiers**
Coryphaenoides guntheri	Gűnthers grenadier
Coryphaenoides rupestris	roundnose grenadier
Trachyrynchus murrayi	Murray´s longsnout grenadier
Nematonurus armatus	armed grenadier
Ophidae	**Cuskeels**
Spectrunculus grandis	
Pleuronectidae	
Hippoglossus hippoglossus	Halibut

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HEADQUARTERS

MARINE INSTITUTE
Rinville
Oranmore
Galway
Tel: +353 91 387 200
Fax: +353 91 387 201
Email: institute.mail@marine.ie

MARINE INSTITUTE REGIONAL OFFICES & LABORATORIES

MARINE INSTITUTE
80 Harcourt Street
Dublin 2
Tel: +353 1 4766500
Fax: +353 1 4784988

MARINE INSTITUTE
Furnace
Newport
Co. Mayo
Tel: +353 98 42300
Fax: +353 98 42340